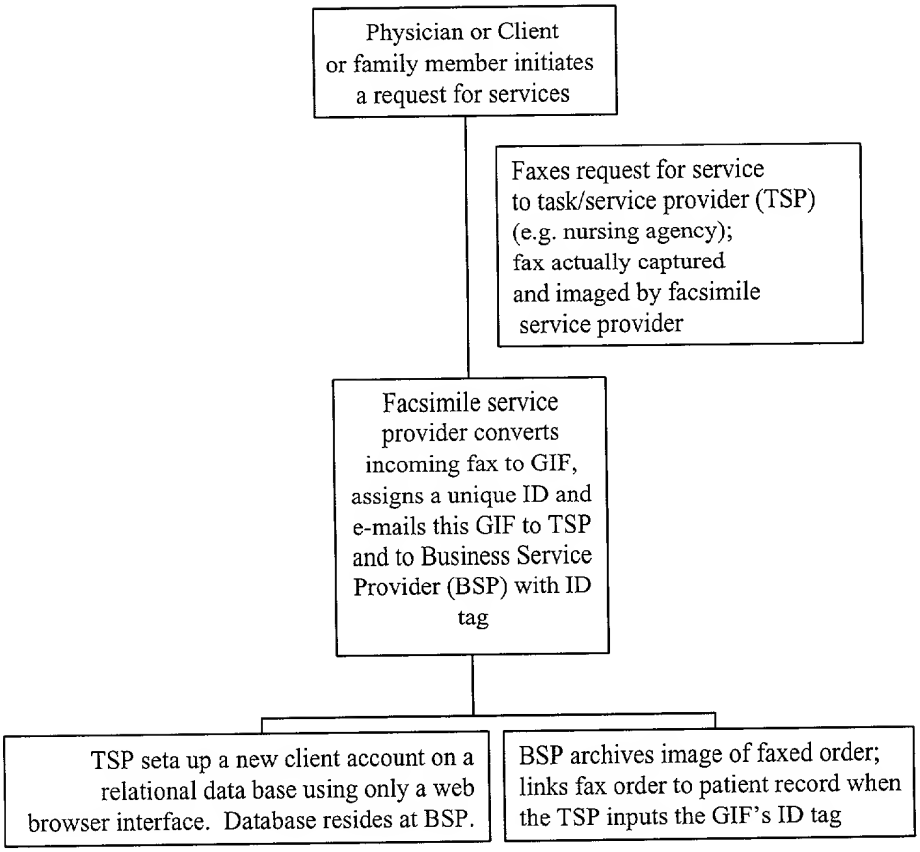
Physician or Client
or family member initiates
a request for services
Faxes request for service
to task/service provider (TSP)
(e.g. nursing agency);
fax actually captured
and imaged by facsimile
service provider
Facsimile service
provider converts
incoming fax to GIF,
assigns a unique ID and
e-mails this GIF to TSP
and to Business Service
Provider (BSP) with ID
tag
TSP seta up a new client account on a
relational data base using only a web
browser interface. Database resides at BSP.
BSP archives image of faxed order;
links fax order to patient record when
the TSP inputs the GIF's ID tag

Fig. 1

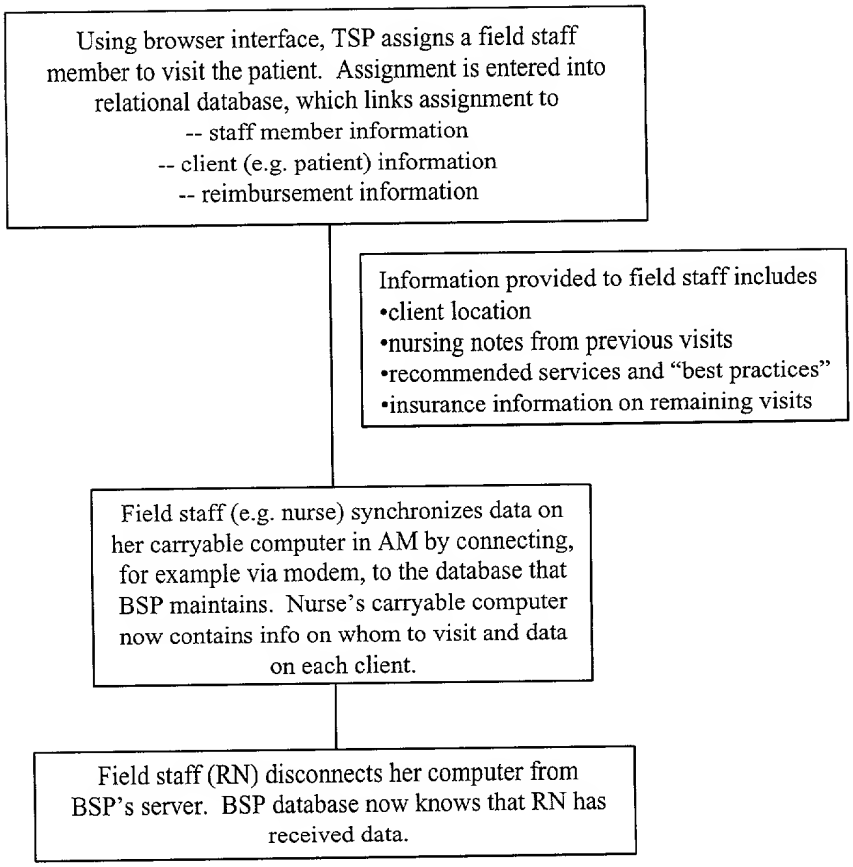
Using browser interface, TSP assigns a field staff member to visit the patient. Assignment is entered into relational database, which links assignment to
-- staff member information
-- client (e.g. patient) information
-- reimbursement information
Information provided to field staff includes
•client location
•nursing notes from previous visits
•recommended services and "best practices"
•insurance information on remaining visits
Field staff (e.g. nurse) synchronizes data on her carryable computer in AM by connecting, for example via modem, to the database that BSP maintains. Nurse's carryable computer now contains info on whom to visit and data on each client.
Field staff (RN) disconnects her computer from BSP's server. BSP database now knows that RN has received data.

Fig. 2

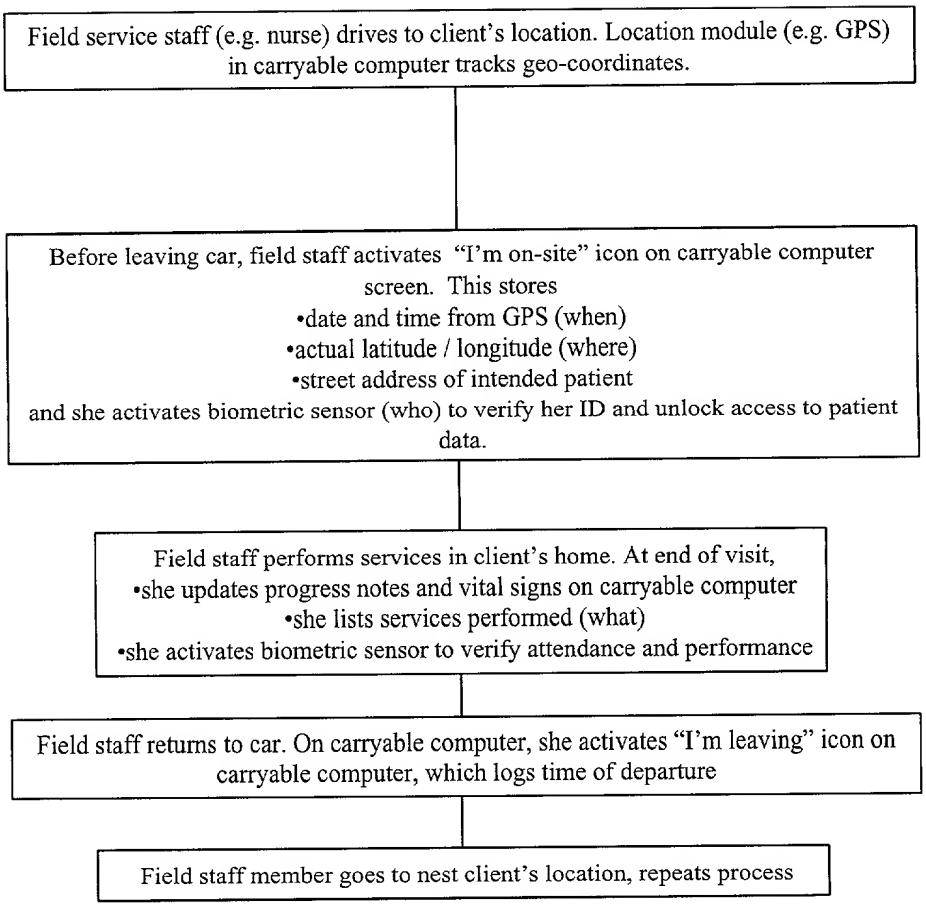
Field service staff (e.g. nurse) drives to client's location. Location module (e.g. GPS) in carryable computer tracks geo-coordinates.
Before leaving car, field staff activates "I'm on-site" icon on carryable computer screen. This stores
•date and time from GPS (when)
•actual latitude / longitude (where)
•street address of intended patient
and she activates biometric sensor (who) to verify her ID and unlock access to patient data.
Field staff performs services in client's home. At end of visit,
•she updates progress notes and vital signs on carryable computer
•she lists services performed (what)
•she activates biometric sensor to verify attendance and performance
Field staff returns to car. On carryable computer, she activates "I'm leaving" icon on carryable computer, which logs time of departure
Field staff member goes to nest client's location, repeats process

Fig. 3

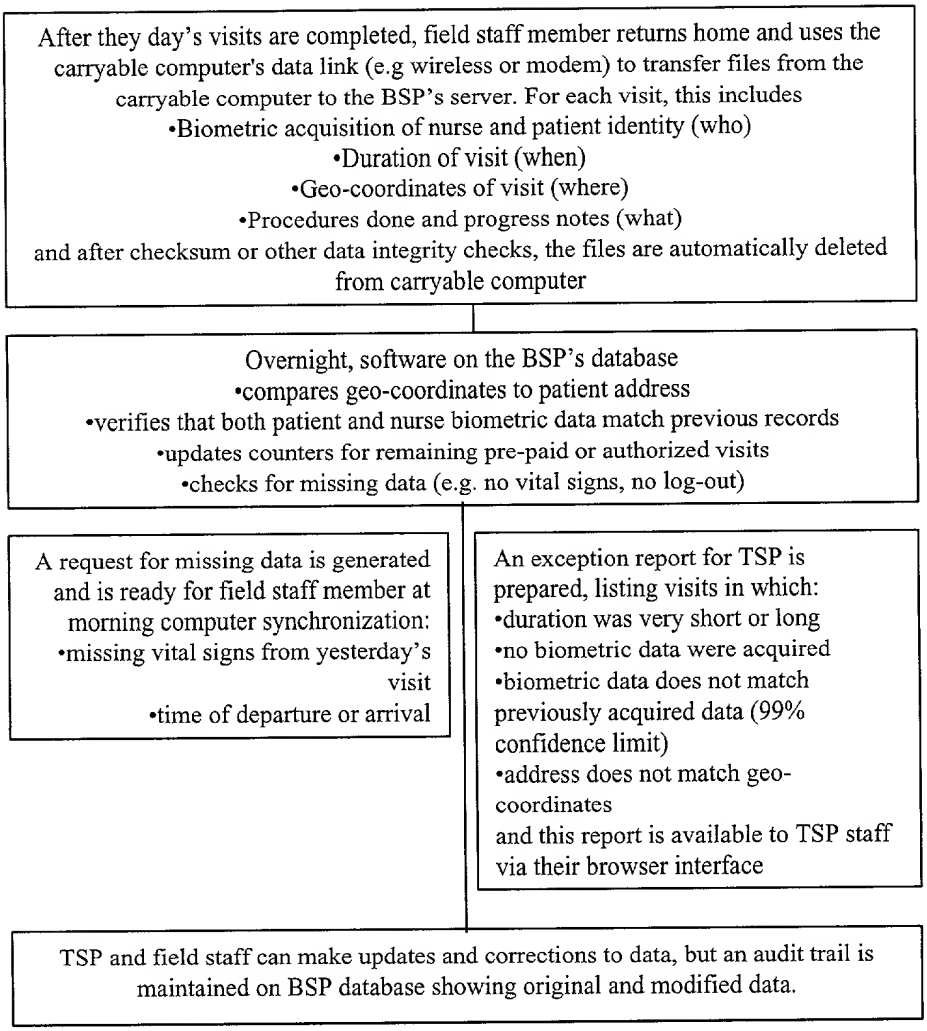
After they day's visits are completed, field staff member returns home and uses the carryable computer's data link (e.g wireless or modem) to transfer files from the carryable computer to the BSP's server. For each visit, this includes
•Biometric acquisition of nurse and patient identity (who)
•Duration of visit (when)
•Geo-coordinates of visit (where)
•Procedures done and progress notes (what)
and after checksum or other data integrity checks, the files are automatically deleted from carryable computer
Overnight, software on the BSP's database
•compares geo-coordinates to patient address
•verifies that both patient and nurse biometric data match previous records
•updates counters for remaining pre-paid or authorized visits
•checks for missing data (e.g. no vital signs, no log-out)
A request for missing data is generated and is ready for field staff member at morning computer synchronization:
•missing vital signs from yesterday's visit
•time of departure or arrival
An exception report for TSP is prepared, listing visits in which:
•duration was very short or long
•no biometric data were acquired
•biometric data does not match previously acquired data (99% confidence limit)
•address does not match geo-coordinates
and this report is available to TSP staff via their browser interface
TSP and field staff can make updates and corrections to data, but an audit trail is maintained on BSP database showing original and modified data.

Fig. 4

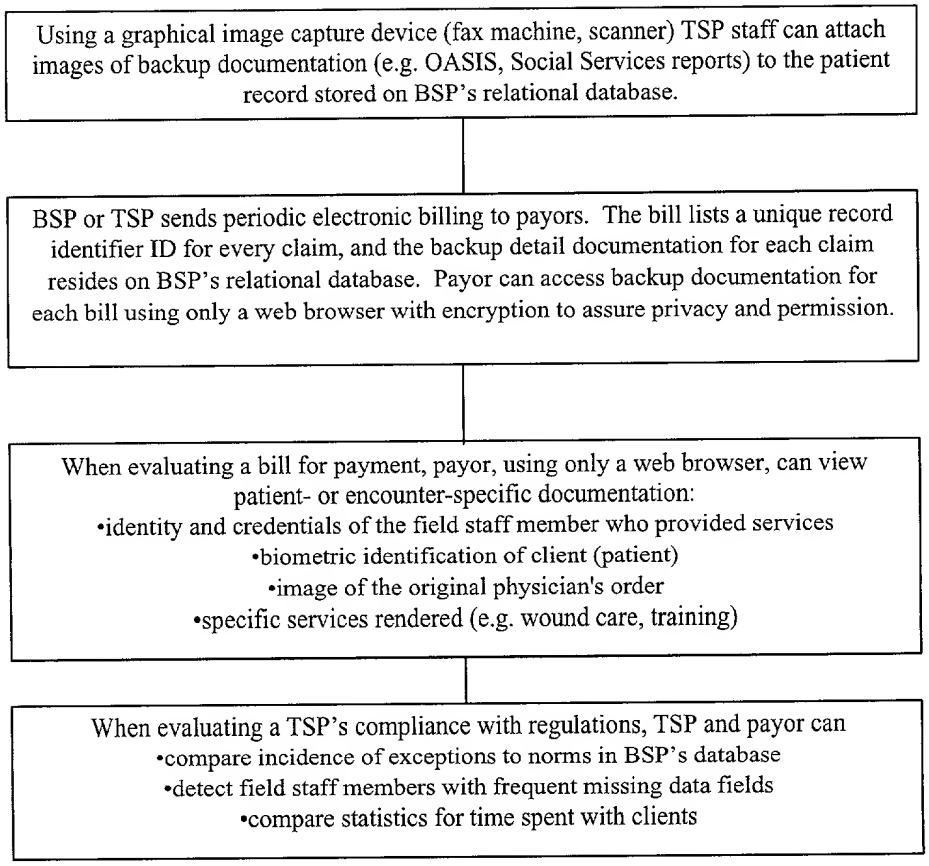
Using a graphical image capture device (fax machine, scanner) TSP staff can attach images of backup documentation (e.g. OASIS, Social Services reports) to the patient record stored on BSP's relational database.
BSP or TSP sends periodic electronic billing to payors. The bill lists a unique record identifier ID for every claim, and the backup detail documentation for each claim resides on BSP's relational database. Payor can access backup documentation for each bill using only a web browser with encryption to assure privacy and permission.
When evaluating a bill for payment, payor, using only a web browser, can view patient- or encounter-specific documentation:
•identity and credentials of the field staff member who provided services
•biometric identification of client (patient)
•image of the original physician's order
•specific services rendered (e.g. wound care, training)
When evaluating a TSP's compliance with regulations, TSP and payor can
•compare incidence of exceptions to norms in BSP's database
•detect field staff members with frequent missing data fields
•compare statistics for time spent with clients

Fig. 5

Field name	Data stored in this field	Comments regarding this field
In general, the fields shown here are those stored on the carryable computer. The server will parse fields differently; for example, first_name and last_name would be separate fields in the server's database.		
patient_name	Wilson, Jane F.	The person providing service, for example a visiting nurse, downloaded this information from the main server to her carryable computer in the morning before departing for her visits.
patient_age_today	67.3	downloaded as described above
patient_location	6052 S. Robertson St. New Orleans LA 70118	ditto
cross_street_1	State St.	ditto
cross_street_2	Palmer Ave.	ditto
patient_phone	504 555 1223	ditto
patient_comments	Lives with husband Bill, a retired carpenter. Does not like to be interrupted during Oprah TV show. Supplemental oxygen	ditto
referring_physician	J. Kaufmann, MD	ditto
most_recent_hospital_discharge	2000-03-28	ditto
discharge_dx	CHF status post MI decubitis ulcer R heel	ditto
current_meds	Nitroglycerin 0.15 mg q 5 min for pain (up to 3) Lasix 40 mg Lopressor 50 mg BID Lanoxin 0.25 O2 0.5 liters/minute	ditto
most_recent_hha_visit	2000-03-25 RN 2000-03-24 aide	ditto
prior_visit_subjective_notes	2000-03-25 pt discharged from Ochsner 1 week ago today. Now able to transfer bed to chair c partial weight bearing, states that energy is slowly returning and that she is using O2 only after exertion and not while watching TV. 2000-03-24 pt disappointed with slow recovery, "tired all the time"	ditto
prior_visit_services	2000-03-25 changed dressing R heel, moderate amount of drainage noted 2000-03-24 light housekeeping, assisted with bath	ditto
remaining_auth_hha_visits	2	ditto

Fig. 6

time_of_arrival	2000-03-31 09:23:56	data capture from time/place (e.g. GPS) module of carryable computer
place_of_arrival	90.08618760N 29.9269257W	ditto
temperature	37.1	person providing service (e.g. nurse) enters this data into carryable computer at time of visit to provide service
pulse	82	ditto
respiration	17	ditto
left_arm_BP	140/110	ditto
right_arm_BP	150/90	ditto
subjective	Pink skin color, but labored breathing after walking to bathroom. States that son visited this morning, brought groceries. Pt had episode of chest pain last night but could not find her nitro.	ditto
services_performed_today	Removed dressing from R heel, noted small amount of purulent drainage c mild odor. Irrigated c normal saline and dry pad, wrapped c curlex	ditto
instructions_to_pt	Instructed in proper admin. of nitro sublingual, 1 every 5 minutes up to 3 tabs. Suggested she keep tabs in separate bottle in easy to find place at bedside. Instructed husband about placing nitroglycerin under pts tongue. Discussed need to omit high Na^+ foods	ditto
plan_for_next_visit	Wound care and continue instruction on meds	ditto
goals	healing of decubitis within 6 weeks med compliance reduce BP dietary compliance	ditto
RN_digital_signature	3F29 4BAC 0000 FFFF 3D77	binary compressed data captured from biometric module on carryable device; could be fingerprint, voiceprint, or written signature
pt_digital_signature	A479 9D00 47BF FFF7 01AB	ditto
time_of_departure	2000-03-31 10:09:33	data capture from time/place (e.g. GPS) module of carryable computer
place_of_departure	90.08618783N 29.9269215W	ditto

Fig. 7